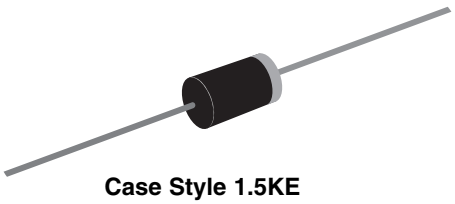
# ICTE5 thru ICTE18C, 1N6373 thru 1N6386



## TRANSZORB® Transient Voltage Suppressors



**Case Style 1.5KE**

### FEATURES

- Glass passivated chip junction
- Available in uni-directional and bi-directional
- 1500 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

| PRIMARY CHARACTERISTICS | |
|---|---|
| $V_{WM}$ | 5.0 V to 18 V |
| $V_{BR}$ (uni-directional) | 6.0 V to 21.2 V |
| $V_{BR}$ (bi-directional) | 9.2 V to 21.2 V |
| $P_{PPM}$ | 1500 W |
| $P_D$ | 6.5 W |
| $I_{FSM}$ | 200 A |
| $T_J$ max. | 175 °C |
| Polarity | Uni-directional, bi-directional |
| Package | 1.5KE |

### DEVICES FOR BI-DIRECTION APPLICATIONS

For bi-directional types, use C suffix (e.g. ICTE18C). Electrical characteristics apply in both directions.

### TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, and telecommunication.

### MECHANICAL DATA

**Case:** 1.5KE, molded epoxy body over passivated junction Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant and commercial grade Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified ("X" denotes revision code e.g. A, B, ...)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** for uni-directional types the color band denotes cathode end, no marking on bi-directional types

| MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted) | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **LIMIT** | **UNIT** |
| Peak pulse power dissipation with a 10/1000 µs waveform (1) (fig. 1) | $P_{PPM}$ | 1500 | W |
| Peak pulse current with a 10/1000 µs waveform (1) (fig. 3) | $I_{PPM}$ | See next table | A |
| Power dissipation on infinite heatsink at $T_L$ = 75 °C (fig. 8) | $P_D$ | 6.5 | W |
| Peak forward surge current 8.3 ms single half sine-wave uni-directional only (2) | $I_{FSM}$ | 200 | A |
| Maximum instantaneous forward voltage at 100 A for uni-directional only | $V_F$ | 3.5 | V |
| Operating junction and storage temperature range | $T_J$, $T_{STG}$ | -55 to +175 | °C |

**Notes**

(1) Non-repetitive current pulse, per fig. 3 and derated above $T_A$ = 25 °C per fig. 2

(2) 8.3 ms single half sine-wave, duty cycle = 4 pulses per minute maximum



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| **ELECTRICAL CHARACTERISTICS (JEDEC® REGISTERED DATA)** ($T_A$ = 25 °C unless otherwise noted) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **JEDEC® TYPE NUMBER** | **GENERAL SEMICONDUCTOR PART NUMBER** | **STAND-OFF VOLTAGE $V_{WM}$ (V)** | **BREAKDOWN VOLTAGE $V_{BR}$ AT 1.0 mA (V) MIN.** | **MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ (µA)** | **MAXIMUM CLAMPING VOLTAGE AT $I_{PP}$ = 1.0 A $V_C$ (V)** | **MAXIMUM CLAMPING VOLTAGE AT $I_{PP}$ = 10 A $V_C$ (V)** | **MAXIMUM PEAK PULSE CURRENT $I_{PP}$ (A)** |
| **UNI-DIRECTIONAL TYPES** | | | | | | | |
| 1N6373 (2) | ICTE5 (2) | 5.0 | 6.0 | 300 | 7.1 | 7.5 | 160 |
| 1N6374 | ICTE8 | 8.0 | 9.4 | 25.0 | 11.3 | 11.5 | 100 |
| 1N6375 | ICTE10 | 10.0 | 11.7 | 2.0 | 13.7 | 14.1 | 90 |
| 1N6376 | ICTE12 | 12.0 | 14.1 | 2.0 | 16.1 | 16.5 | 70 |
| 1N6377 | ICTE15 | 15.0 | 17.6 | 2.0 | 20.1 | 20.6 | 60 |
| 1N6378 | ICTE18 | 18.0 | 21.2 | 2.0 | 24.2 | 25.2 | 50 |
| **BI-DIRECTIONAL TYPES** | | | | | | | |
| 1N6382 | ICTE8C | 8.0 | 9.4 | 50 | 11.4 | 11.6 | 100 |
| 1N6383 | ICTE10C | 10.0 | 11.7 | 2.0 | 14.1 | 14.5 | 90 |
| 1N6384 | ICTE12C | 12.0 | 14.1 | 2.0 | 16.7 | 17.1 | 70 |
| 1N6385 | ICTE15C | 15.0 | 17.6 | 2.0 | 20.8 | 21.4 | 60 |
| 1N6386 | ICTE18C | 18.0 | 21.2 | 2.0 | 24.8 | 25.5 | 50 |

**Notes**

(1) "C" suffix indicates bi-directional

(2) ICTE5 and 1N6373 are not available as bi-directional

(3) Clamping factor: 1.33 at full rated power; 1.20 at 50 % rated power; clamping factor: the ratio of the actual $V_C$ (clamping voltage) to the $V_{BR}$ (breakdown voltage) as measured on a specific device

| **ORDERING INFORMATION** (Example) | | | | |
|---|---|---|---|---|
| **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PREFERRED PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| ICTE5-E3/54 | 0.968 | 54 | 1400 | 13" diameter paper tape and reel |
| ICTE5HE3_A/C (1) | 0.968 | C | 1400 | 13" diameter paper tape and reel |

**Note**

(1) AEC-Q101 qualified



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## RATINGS AND CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

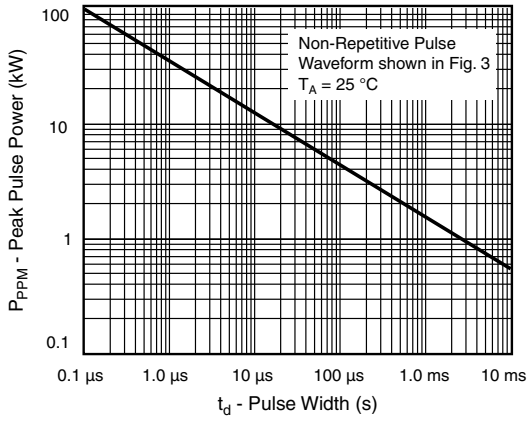


Fig. 1 - Peak Pulse Power Rating Curve

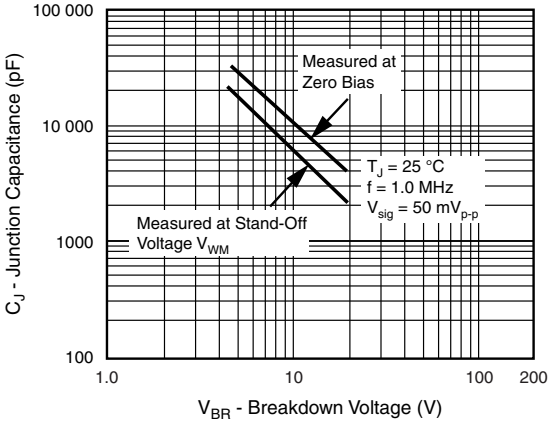


Fig. 4 - Typical Junction Capacitance Uni-Directional

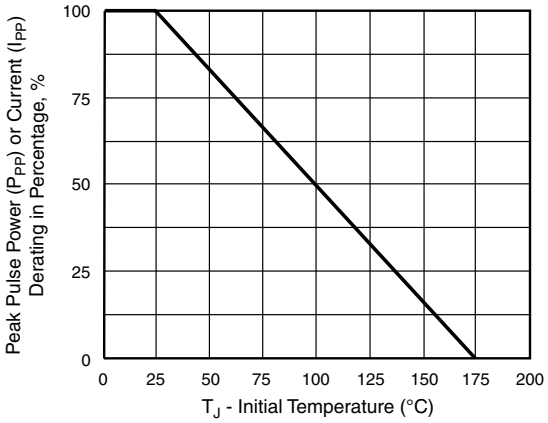


Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

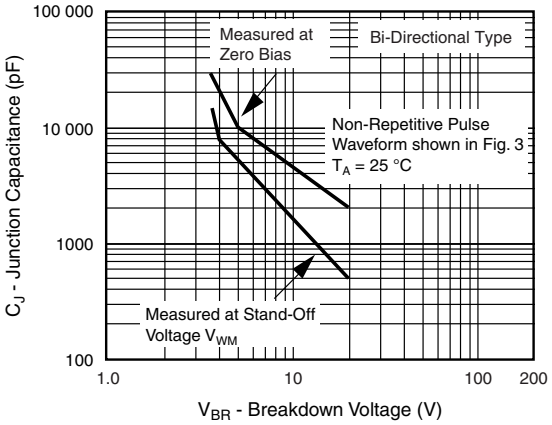


Fig. 5 - Typical Junction Capacitance

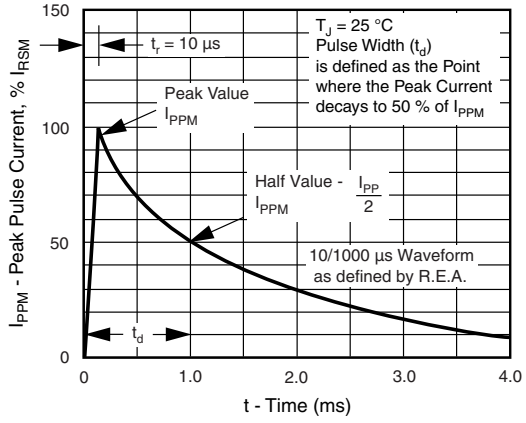


Fig. 3 - Pulse Waveform

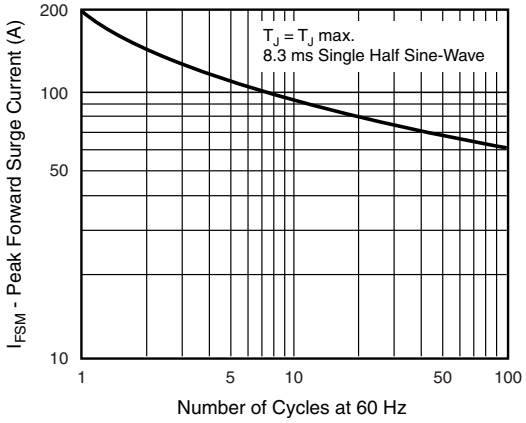


Fig. 6 - Maximum Non-Repetitive Forward Surge Current
Uni-Directional Only



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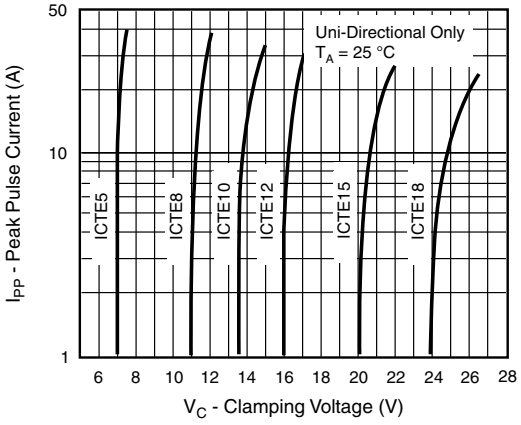



Fig. 7 - Typical Characteristics Clamping Voltage

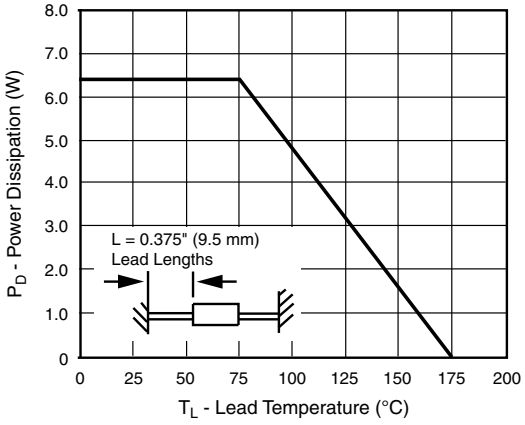
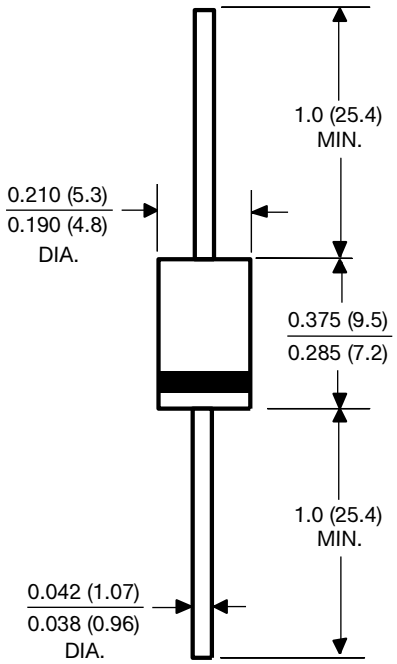



Fig. 8 - Power Derating Curve

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**Case Style 1.5KE**



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